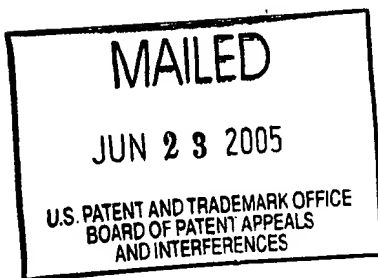


The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES



Ex parte KENNETH D. BEER,
LAURENCE W. DAVIES
and
PETER J. FRITZ

Appeal No. 2005-1314
Application 09/597,453

ON BRIEF

Before HANLON, WALTZ, and KRATZ, Administrative Patent Judges.

HANLON, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on an appeal under 35 U.S.C. § 134 from the final rejection of claims 13-28, 65-96 and 121-126. Claims 1-12, 29-64 and 97-120 are also pending but have been withdrawn from consideration. The claims on appeal are directed to a reinforcement mat for use in forming a pultruded part.

Claim 13 is representative and reads as follows:

13. A mat for use as reinforcement for a resin composition to be used in forming an elongated, pultruded part of constant transverse cross-section using a pultrusion die, said mat comprising:

a first layer of continuous, generally longitudinally-extending fibers which provide longitudinal strength to the mat;

a second layer of generally transverse reinforcement fibers in association with the first layer of generally longitudinal fibers and oriented in a direction at an angle with respect to the longitudinal pull direction of the mat to provide transverse strength to the mat;

a third layer of diagonal transport fibers for the transverse reinforcement fibers, at least certain of the transport fibers extending diagonally of the first layer of generally longitudinally-extending fibers and oriented to provide shear strength stiffness and anti-skewing resistance to the mat; and

a batting layer comprising polymeric fibers, at least a portion of which extend through the thickness of the mat layers and interconnect the fibers of all of the layers to increase the shape-retaining capability of the mat during pultrusion of the part.

The examiner relies on the following references:

Vane	5,055,242	Oct. 8, 1991
Beer et al. (Beer)	5,910,458	June 8, 1999

The sole issue in this appeal is whether claims 13-28, 65-96 and 121-126 were properly rejected under 35 U.S.C. § 103(a) as being unpatentable over Vane in view of Beer.

Grouping of claims

According to appellants, "[t]he claims stand and fall together." Brief, p. 4. Therefore, for purposes of appeal, the patentability of claims 14-28, 65-96 and 121-126 stands or falls with the patentability of claim 13. See 37 CFR § 1.192(c)(7) (2003); 37 CFR § 41.67(c)(1)(vii) (2004).

Discussion

I.

Vane discloses a mat for use in forming reinforced plastic articles by pultrusion. The mat comprises a plurality of superimposed layers of reinforcement material, each layer consisting of a plurality of unidirectional non-woven yarns or threads laid side by side. See col. 2, lines 11-19.

Preferably, the yarns or threads in at least two of said layers are laid so that they extend at 90° to one another. Advantageously, the yarns or threads in at least one further layer are laid so that they extend at an angle of from 45° to 90° with respect to the yarns or threads in at least one of said at least two layers. Thus, for example, said layers may comprise at least a layer in which the yarns or threads extend in a first direction, a layer in which the yarns or threads extend in a second direction at

90° to the first direction, a layer in which the yarns or threads extend in a third direction at 45° to the first direction, and a layer in which the yarns or threads extend in a fourth direction at 45° to the first direction, and 90° to the third direction [(col. 2, lines 36-50)].

The layers of reinforcing material may be stitched together to hold the yarns or threads in each layer in a fixed position relative to one another. See col. 2, lines 64-68. The yarns or threads used to produce the reinforcing material may be yarns, threads, rovings, tows or the like of continuous or discontinuous glass fibers. See col. 2, lines 57-62.

According to one embodiment of the invention disclosed in Vane, at least one film, sheet, ribbon or tape of thermoplastic material may be interposed between at least two layers of reinforcing material and/or applied to one or both of the outer surfaces of the superimposed layers before they are stitched together. See col. 3, lines 20-25. Heat is used to soften the thermoplastic material and wet the reinforcing material prior to the forming step. See col. 3, lines 25-29; col. 6, lines 31-35. Vane also discloses that yarns or threads of thermoplastic material may be interspersed or co-mingled with the yarns or threads in one or more of the layers of reinforcing material to

provide additional matrix material. See col. 5, lines 54-59. Thus, in this embodiment, thermoplastic material extends through one or more of the reinforcing layers in the mat of Vane and interconnects the yarns or threads in those layers. However, the thermoplastic material is not contained in a batting layer as required by claim 13.

The examiner relies on Beer for its teaching of a batting layer in a reinforcement mat for use in forming a polymeric composite by pultrusion. See col. 19, lines 12-18. Specifically, the examiner explains that (Answer, p. 4):

BEER et al. discloses a mat adapted to reinforce a thermosetting matrix material, the mat comprises a primary layer comprising a plurality of generally parallel, essentially continuous glass fiber strands oriented generally parallel to a longitudinal axis of the mat; and a secondary layer positioned adjacent to a surface of the primary layer that comprises a plurality of randomly oriented, generally continuous glass fiber strands. The reference further teaches that the strands of the primary layer are entangled with the strands of the secondary layer by needling together at least a portion of the strands of the primary layer and the strands [of the] secondary layer to form a mat. (Column 2, lines 16-45) [.]

The glass fiber strands comprising the secondary or batting layer are coated on at least a portion of their outer

surfaces with a coating composition comprising polymeric film forming materials and thermoplastic vinyl polymers. See col. 14, lines 30-43. Beer discloses that the entangled strands impart mechanical strength and integrity to the mat. See col. 18, lines 1-3.

The examiner concludes that it would have been obvious to a person having ordinary skill in the art to modify the layer of thermoplastic material in Vane with a needled batting layer of polymer coated glass strands as in Beer to impart additional mechanical strength and integrity to the mat. See Answer, p. 5.

II.

Appellants appear to recognize that all of the claimed elements are disclosed in Beer and Vane. Brief, p. 6. However, appellants argue that there is no motivation to substitute the batting material of Beer for the stitched structure of Vane. Brief, p. 5.

The examiner is not proposing such a substitution. See Answer, p. 6 ("The Examiner has never intended to substitute the stitching of Vane for the batting of Beer."). Rather, the examiner is modifying the layer of thermoplastic material in Vane with the needled batting layer of polymer coated glass strands disclosed in Beer. Nevertheless, appellants also argue that

there is no motivation for this modification because Vane teaches away from mats of non-woven fibers and rejects the use of chopped reinforcing fibers. Brief, p. 5.

Appellants' arguments are not persuasive. Suffice it to say that the mat disclosed in Vane is composed of non-woven fibers, and appellants appear to recognize as much. See col. 2, lines 11-19; Brief, p. 5 (Vane discloses "a reinforcing material having a plurality of superimposed layers of unidirectional non-woven yarns or threads laid side-by-side.").¹

As for the use of chopped reinforcing fibers, Vane rejects their use in combination with a resin material. See col. 1, lines 28-37. However, Vane does not reject their use in combination with a primary layer of continuous reinforcing fibers as in the mat of Beer. Furthermore, the batting layer of Beer is not limited to chopped reinforcing fibers. Beer discloses that the batting layer may also be composed of continuous reinforcing fibers. See In re Lamberti, 545 F.2d 747, 750, 192 USPQ 278, 280 (CCPA 1976) (a reference is not limited to a particular example or a preferred embodiment but rather must be considered for all

¹ According to Vane, the yarns or threads used to produce the reinforcing material may be yarns, threads, rovings, tows or the like, of continuous or discontinuous fibers. See col. 2, lines 57-59.

that it expressly teaches and fairly suggests to one having ordinary skill in the art).

Appellants further argue that Vane does not suggest using two structures to secure the reinforcing fibers together, and by selecting stitches to secure the layers of the mat together, Vane teaches away from the batting layer of Beer. See Brief, pp. 7-8 and 9-10.

Vane uses two structures, i.e., a thermoplastic material in the form of layers and/or yarns or threads AND stitches, to secure the layers of the mat together. See col. 5, lines 42-53. Therefore, it cannot be said that the use of stitches in Vane "teaches away" from the batting layer described in Beer. See Para-Ordnance Mfg. v. SGS Importers Int'l, 73 F3d 1085, 1090, 37 USPQ2d 1237, 1241 (Fed. Cir. 1995) (the Browning Hi-Power handgun does not teach away from the claimed invention; while it fails to disclose a converging frame, it does not warn a person against using convergence).

Appellants further argue that Beer does not provide any suggestion or motivation for the proposed combination. Specifically, appellants argue that Beer does not suggest using two structures, i.e., a needled batting layer and stitches, to secure the reinforcing fibers in a fixed relationship relative to

one another and even rejects the use of stitching to secure the fibers together. See Brief, pp. 8 and 9-10.

Again, appellants' arguments are not persuasive. The examiner is not proposing to modify the mat of Beer but rather is relying on the teachings of Beer to modify the mat of Vane. See Answer, p. 8. ("The Examiner is not proposing a modification of BEER et al. but rather is relying on the teachings of BEER et al. to provide the "additional matrix material" called for by VANE."). Therefore, it is irrelevant whether Beer suggests using stitches in combination with a batting layer to secure multiple layers of reinforcing material together in the disclosed mat. See In re Keller, 642 F.2d 413, 426, 208 USPQ 871, 882 (CCPA 1981) (a rejection premised upon a proper combination of references cannot be overcome by attacking the references individually).

Finally, appellants argue that there is no motivation to combine Vane and Beer because both references "teach methods and structures that provide increased strength, without the proposed redundant structure," i.e., the needled batting layer described in Beer. Specifically, appellants argue that Vane increases the strength of the disclosed mat by varying the number of layers and the orientation of the yarns or threads in each

layer, and Beer increases the strength of the disclosed mat by adding layers of glass fiber strands. See Brief, pp. 8-9.

This argument is also not persuasive. Beer expressly discloses a mat having a needled batting layer. Needling entangles the strands of the primary and secondary layers of the mat and increases the strength of the mat through that bond. See col. 17, line 59-col. 18, line 3; col. 18, lines 40-48. In contrast, one of ordinary skill in the art would not have expected the variations discussed in Vane to create or strengthen any bond between the layers. Therefore, the needled batting layer disclosed in Beer is not a "redundant structure."

III.

For the reasons set forth above, appellants have failed to rebut the prima facie case of obviousness set forth by the examiner. See In re Piasecki, 745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed. Cir. 1984) ("[a]fter a prima facie case of obviousness has been established, the burden of going forward shifts to the applicant"). Therefore, the rejection of claim 13 under 35 U.S.C. § 103(a) as being unpatentable over Vane in view of Beer is affirmed. Since claims 14-28, 65-96 and 121-126 stand or fall with the patentability of claim 13, the rejection of claims 14-

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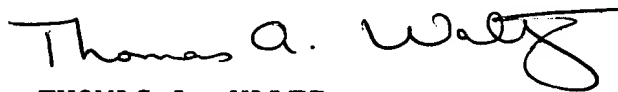
28, 65-96 and 121-126 under 35 U.S.C. § 103(a) as being
unpatentable over Vane in view of Beer is also affirmed.

No time period for taking any subsequent action in
connection with this appeal may be extended under 37 CFR
§ 1.136(a).

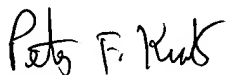
AFFIRMED



ADRIENE LEPIANE HANLON
Administrative Patent Judge



THOMAS A. WALTZ
Administrative Patent Judge



PETER F. KRATZ
Administrative Patent Judge

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